

In re: Deok-Hyung Lee et al.
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REMARKS

Applicants appreciate the thorough and detailed examination of the present application that is reflected in the Official Action of June 7, 2005. Applicants also appreciate the Examiner's citation of U.S. Patent 6,525,403 to Inaba et al. and published U.S. Patent Application US 2004/0126969 A1 to Brown et al. In response, independent Claims 1 and 13 have been amended to further clarify the patentable distinctions over Inaba et al. and/or Brown et al. Moreover, many of the dependent claims are separately patentable. Accordingly, Applicants respectfully request withdrawal of the outstanding rejections and allowance of the present application, for the reasons that now will be described.

Independent Claim 1 Is Patentable Over Inaba et al.

Independent Claim 1 has been amended to add the recitation of a punch-through stop layer as follows:

a punch-through stop layer that is confined to beneath the channel region and having a higher doping concentration than the sidewalls of the fin in the channel region.

This punch-through stop layer is illustrated, for example, in Figures 2A and 2B of the present application at 62a, and the confinement beneath the channel region 70 is clearly shown in the orthogonal cross-sectional views of Figures 2A and 2B.

The Official Action noted that Inaba et al. illustrates p⁺ layers 17 in Figure 7. However, as clearly illustrated in Inaba et al. Figure 7, these p⁺ layers extend well beyond the channel region in both orthogonal directions. Specifically, these p⁺ layers extend well beyond the opposing sidewalls of the fin, and also extend well beyond the channel region to beneath the source and drain regions 15 and 16. Accordingly, Inaba et al. teaches away from the above-quoted recitations of Claim 1.

As noted in the present application, for example at Page 7, lines 21-28:

The gate electrodes 74 may be formed on the fin 54a and on the device isolation layer 56. Accordingly, in some embodiments, the gate electrode 74 may not control a portion of the fin located lower than the gate electrode 74 that is in contact with the device isolation layer 56. As a result, punch-through may occur at the fin. To reduce or prevent this punch-through, a transistor according to some embodiments of the present invention may further include a punch-through stop layer 62a. In some embodiments, the punch-

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through stop layer 62a is doped at a higher concentration than the lightly doped region 64.

For at least these reasons, amended Claim 1 is neither anticipated, by nor obvious in view of, Inaba et al.

Claim 13 Is Patentable Over Inaba et al. Taken Singly Or In Combination With Brown et al.

Claim 13 has been amended similarly to Claim 1, and is patentable over Inaba et al. for at least the reasons that were described in connection with Claim 1. This analysis will not be repeated for the sake of brevity. Moreover, Brown et al. does not appear to describe or suggest any punch-through stop layer that is confined to beneath the channel region. Accordingly, Claim 13 is unobvious over Inaba et al. in view of Brown et al.

Claims 3 and 18 Are Independently Patentable

Applicants respectfully submit that Claims 3 and 18 as originally filed are independently patentable over Inaba et al. In order to highlight this distinction, Claims 3 and 18 have been rewritten in independent form, and Claim 3 has been amended similarly to original Claim 18 to highlight that the fin is on the insulation layer opposite the semiconductor layer. In contrast, as clearly shown in Inaba et al. Figure 7, the device isolation insulating film 12 does not extend beneath the fin 11A. Rather, the insulating film 12 is laterally offset from the fin 11A. Accordingly, Inaba et al. teaches away from the recitations of Claims 3 and 18, where the fin is recited as being on the insulating layer, opposite the semiconductor layer or opposite the substrate. Accordingly, Claims 3 and 18 are independently patentable.

Applicants also wish to note that Claim 6 has been amended to properly depend from Claim 2, as noted by the Examiner. Claim 6 also has been amended to provide proper antecedent basis with amended Claim 1.

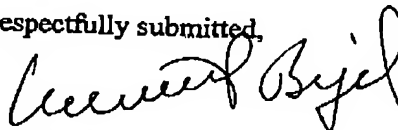
Conclusion

Applicants again appreciate the thorough examination and the new citations of Inaba et al. and Brown et al. Applicants have now shown that the pending claims are

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patentable over these two references, taken singly or in combination. Accordingly, Applicants respectfully request withdrawal of the outstanding rejections and allowance of the present application.

Respectfully submitted,



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